DOCUMENT RESUME

ED 191 544 PS 010 634

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TITLE Social Determinants of the Timing of the First Birth.
SPONS AGENCY National Inst. of Child Health and Human Development (NIH), Bethesda, Md. Center for Population Research.: Spencer Foundation, Chicago, Ill.
PUB DATE Feb 79
GRANT CPR-05798
NOTE 42p.: Based on a paper presented at the Annual Meeting of the American Public Health Association (106th, Los Angeles, CA, October, 1978).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Age: *Birth: *Educational Attainment: Fathers: Models: Mothers: *Racial Factors: *Religious Factors: *Social Influences: Statistical Analysis
IDENTIFIERS *First Born

ABSTRACT

These statistical analyses investigate several factors that could affect the age at which a woman first gives birth. The data used were obtained from the 1970 National Fertility Study (NFS) and the 1973 Family Growth Study (FGS). The factors were grouped into three temporally sequential categories: (a) background or family of orientation characteristics: (b) characteristics of early adolescence: and (c) processes occurring simultaneously with the timing of the first birth. A discussion of why the factors might theoretically be related to age at first birth is presented. A non-recursive model was developed and tested in which age at first birth is allowed to have a reciprocal effect on level of education. Level of education at time of marriage was found to be the most important predictor of age at first birth, but age at first birth had only a small reciprocal effect on education. Although a few social determinants, such as race, religion, and smoking at a young age, were found to have a direct effect on age at first birth, most of these social factors affect age at first birth through the education level factor. Determinants of male ages at first birth, to the extent possible with samples of women who reported having been married, were also explored. Results indicated no major substantive differences between men and women in regard to determinants of age at first birth. (Author/RH)

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ED191544

February 1979

SOCIAL DETERMINANTS OF THE TIMING OF THE FIRST BIRTH

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PS 010634

Revised version of a paper presented at the 106th annual meeting of the American Public Health Association, Los Angeles, October 1978.

CN001737

Acknowledgements

This analysis was supported in part by grants from the Spencer Foundation, from the University Research Council of the University of North Carolina, and by a Center for Population Research grant No. 05798 to the Carolina Population Center from the Center for Population Research of the National Institute of Child Health and Human Development.

ABSTRACT

A woman's first birth is one of the most significant events in her life. It signifies the taking on of the roles and responsibilities of a mother, often to the exclusion of further education and career building roles. The earlier these roles and responsibilities are undertaken the less likely are alternatives to be taken, and the greater is the expected quantity and pace of subsequent childbearing. Consequently, this paper explores the social determinants of the timing of the first birth. A model is developed and tested in which a number of social factors are hypothesized to effect age at first birth. Age at first birth is allowed to have a reciprocal effect on education, thus, the model is non-recursive. Education at marriage is the most important predictor of age at first birth; the relationship is positive. Although a few social determinants do have a direct effect on age at first birth (such as race, religion, and smoking at young ages) most determinants affect age at first birth through education.

The timing of the beginning of childbearing is very significant in the life of a woman (as well as in the life of a man) because motherhood involves a substantial commitment of time and resources to the child (children). Moreover, the timing of maternity sets the stage within which other roles are assumed.

Research to date suggests that a woman's age at first birth has many subsequent effects in her life. It has a negative effect on occupational attainment, marital stability, asset accumulation, and the health of the woman, as well as a positive effect on the spacing of subsequent children, and on completed family size (Bumpass, Rindfuss and Janosik, 1978; Coombs and Freedman, 1966; Coombs and Freedman, 1970; Koo, Bilsborrow and Suchindran, 1978; Menken, 1972: and Presser, 1971). To the extent that parenthood is often taken as the event that terminates adolescence (Hoffman, 1978), the timing of the first birth affects the length of adolescence. At the macro level, trends in the age at first birth have important effects on the pace of social change, period fertility trends and the state of the economy (Rindfuss, forthcoming). Age at first birth also affects the milieu in which children are raised, the kinds of opportunities available to children and their intellectual development (Rindfuss, forthcoming; Zajonc, 1976; Record, McKeown and Edwards, 1969).

Given the wide ranging consequences of the timing of the first birth, there has been surprisingly little research on the social and cultural determinants of age at first birth. In the present paper we examine a variety of characteristics that could affect age at first birth. The first section of this paper discusses why these factors might theoretically be related to age at first birth. Those factors are grouped into three temporal categories: a) background or family of orientation characteristics, b) characteristics of early

adolescence, and c) processes occurring simultaneously with the timing of the first birth. The remainder of the paper reports our empirical examination of the effects of these variables on age at first birth.

Background characteristics

We expect that blacks will have their first child earlier than whites. There are a number of reasons for this. First, the aggregate educational and job market situations facing blacks (males and females) has not been as favorable as that faced by whites (Blau and Duncan, 1967; Hauser and Featherman, 1977). Thus, we might expect early motherhood to be an alternative to higher education or labor force participation. Second, it has been reported by a number of social scientists, especially those doing ethnographic research, that becoming a mother at a very young age is an accepted method for a black woman to establish her adulthood (e.g. Rainwater, 1970). Similar values and beliefs are not reported among whites. Finally, age at first intercourse is earlier among blacks (Kantner and Zelnik, 1972; Zelnik and Kantner, 1978a), blacks are less likely to use contraception before the first birth (Rindfuss and Westoff, 1974; Zelnik and Kantner, 1978b), and when they use, blacks use less effective methods (Rindfuss and Westoff, 1974). Thus, for both accidental and intentional reasons, blacks are more likely to have an early first birth than whites.

Catholics should have a somewhat later age at first birth than non-Catholics. First, some of the Catholic groups, such as the Irish Catholics, have had a long tradition of late ages at marriage, delaying the age at first birth. This is still the case in Ireland today (Kennedy, 1973). Furthermore, Catholic doctrine prohibits sex outside of marriage. To the extent that this doctrine is adhered to, premarital pregnancies and early age at first

birth should be reduced. However, Catholic doctrine also prohibits the use of any contraceptive--with the exception of rythmn. This may operate in the opposite direction leading to unplanned early pregnancy and a younger age at first birth. Finally, the recent convergence of Catholic and non-Catholic fertility behavior (see Bumpass and Westoff, 1973; Westoff and Jones, 1977) suggests that whatever differences currently exist will diminish in the future. Further, Catholics tend to have lower levels of education than non-Catholics (Greeley, 1974), thus the indirect effect through education may reduce age at first birth.

We expect that those women who grew up on a farm will become mothers at a younger age than those who did not. Early motherhood may seem more attractive in comparison to pursuing a career when educational opportunities are limited, as is the case in many rural areas (Duncan and Reiss, 1956). Similarly, the lack of attractive, non-farm, female career opportunities in rural areas may make early motherhood seem more viable. Thus, the indirect effect through educational and career aspirations should lead to a younger age at first birth. The way in which young farmers get started in their farming career may also be relevant. To the extent that young farmers begin by going into business with their parents, there is less pressure on those in farm areas to postpone the first birth until the prospective father is established in a career. However, if young farmers can begin only by purchasing their own farms the opposite effect would result because of the expense involved in purchasing a farm and farm equipment. Finally, earlier work (Duncan, 1943) has shown that rural women have their first birth at younger ages than urban women.

Women growing up in the South are likely to experience maternity earlier than those growing up in other parts of the country. One reason is that traditionally the South has legally allowed younger marriages than the rest of the country, particularly in such states as Alabama, Mississippi, Texas and North Carolina (e.g., see Reader's Digest, 1967). Furthermore, the educational and career opportunities available to women have been more limited in the South than they have been in other parts of the country, thus leading to a negative indirect effect. Finally, the South has traditionally had higher levels of fertility than the rest of the country (Rindfuss, 1978), and this may lead to a norm of earlier ages at motherhood. With the recent movement of a variety of industries to the South, and the reversal in South-nonSouth fertility differentials, this relationship may change in the future.

We expect age at first birth to be inversely related to number of siblings. The larger the family of orientation, the greater the economic and psychic push to leave, and thus, the earlier availability of the girl for motherhood. The larger the family of orientation the more difficult it is to send daughters to college. Thus, by default, early motherhood can be an alternative to higher education. Furthermore the larger the family of orientation the greater the likelihood that the girl's mother started having children at a very young age. Early childbearing norms might be transmitted intergenerationally. Finally, there might be less parental guidance if the family size is large. This might lead to a higher probability of an accidental early age at motherhood. However, given the mixed results reported in the literature to date with respect to completed family size (Berent, 1953; Kantner and Potter, 1954; Duncan, et al., 1965; Hendershot, 1969; McAllister, Stokes and Knapp, 1974; and Johnson and Stokes, 1976), we expect the effect of number of siblings to be small.

Woman's father's occupational status will be positively associated with age at first birth. However, we expect this effect to be indirect, through the woman's educational attainment. That respondent's father's occupation affects respondent's education attainment is well-known (Alexander and Eckland, 1974; Blau and Duncan, 1967; Duncan, Featherman and Duncan, 1972; Hauser, 1971; Kerckhoff and Campbell, 1977; Sewell and Hauser, 1975; Sewell and Shah, 1968), and does not require further elaboration here. It can be expected that families of orientation where the father has a high status job would be more likely to encourage the daughters to postpone childbearing than families of orientation where the father has a low status job. However, the most likely explicit and implicit justification for this encouragement would be to allow the daughters time to complete their education, and thus the effect on age at first birth would be indirect. It also might be argued that there is an intergenerational transmission of norms regarding age at first birth. Since the postponement of a first birth can lead to a higher status job for the husband (see Rindfuss, forthcoming), husbands (i.e., fathers) might pass on norms regarding age at first birth to their daughters. However, we feel that other variables in the model, such as race, farm background, region, and religion are more likely to be responsible for transmission of intergenerational norms regarding age at first birth.

Ethnicity is another factor which might be responsible for the intergenerational transmission of norms regarding age at first birth. We have already discussed one case: the Irish. However, this should be true of other groups as well. For example, descendents of the Mediterranean cultures traditionally have a young age at first marriage, and presumably, a young age at first birth. To the extent that ethnic ties have weakened over time we would expect the relationship of ethnicity to age at first birth to have become

weaker over time. Ethnicity is not included in our basic model, but its effect is examined later in the paper.

Early adolescent characteristics

We expect smoking in early adolescence to be inversely related to age at first birth. It should affect age at first birth both directly and indirectly through its effect on educational attainment. Here, smoking is an indicator of a nexus of variables which may lead to an early first birth. Reynolds and Nichols (1976) suggest a direct relationship exists between personality characteristics and cigarette smoking. According to psychological tests smokers were found to be less well adjusted and more likely to engage in antisocial behavior than either non-smokers or smokers who have just quit smoking. Fracchis, et.al. (1974) indicate that cigarette smoking is a behavioral tendency that may be motivated by "rebelliousness, resentment of authority, sensation seeking or a need to reduce tension and achieve 'adult' status. . ." The conclusion is drawn that persons who begin smoking at early ages have tendencies to begin other adult behaviors at early ages.

From this background it is possible to draw linkages between youthful cigarette smoking and both the early timing of first birth and less education at time of marriage. Youthful smoking appears to be a symptom of a personality trait that leads to the willingness and desire on the part of youths to engage in activities that are commonly restricted to older persons. Engaging in such "adult" activities as sexual intercourse, marriage, and permanent entry into the labor force at ages earlier than considered the norm will result in, all else being equal, an earlier age at the time of the first birth.

Those who were living with both parents at age 14 are likely to have an older age at first birth than those who are not living with both parents at age

14. The rationale is that those not living with both parents at age 14 had a somewhat less desirable homelife than those who were. The reasons for living with one or neither parent may be death of the parent or separation of parents for reasons of marital discord. In either case young women might begin a family of procreation earlier, as a form of escape, than those who resided with both parents. Furthermore, the girl who is not living with both parents at age 14 may find herself in a position of having fewer resources to call upon than the girl who is living with both parents. A single parent may be less able to provide the girl with educational and career opportunities. Lacking access to such opportunities may make establishing a new family a more attractive alternative. Furthermore, living in a one parent (or no parent) family during adolescence may mean less in the way of parental guidance. This could lead to a younger age at first birth as a result of an accidental pregnancy.

Finally, we expect fecundity to be related to age at first birth. All other things being equal, those who are less fecund should have a later age at first birth. However, fecundity is almost impossible to measure directly (Rindfuss and Bumpass, 1978). Yet, one generally available indicator of fecundity as it affects age at first birth is the number of miscarriages and stillbirths before the first birth. A miscarriage before the first birth postpones the first birth in a direct and obvious way: it takes time to conceive again and carry that conception to successful parturition. It also gives the woman a second chance if she wants to use contraception or abstain. The time element involved as the result of a miscarriage before the first birth can be substantial since approximately one-fourth of the women who have one miscarriage before their first birth have two or more miscarriages before their first birth.[1]

Simultaneous Factors

During the time period when decisions (or non-decisions) about the timing of the first birth are being made, evaluated, re-evaluated, and changed, a variety of other decision making processes are occurring which may reciprocally impact on the first birth timing decision. The education decision making process is probably the best example. We expect that education will be inversely related to age at first birth (Rindfuss and Bumpass, forthcoming). Aspirations for high educational attainment can lead to a preference for postponing the first birth in order to achieve that educational attainment. Conversely, a preference for postponing the first birth might influence the woman to stay in school longer than she might have otherwise. (This relationship is discussed in greater detail in Rindfuss and Bumpass, forthcoming).

Decisions about contraception and its use before the first birth is another process that is going on simultaneously with the decision-making process regarding the timing of the first birth. We expect age at first birth to be later among those who use contraception before the first birth, and conversely we expect age at first birth to be younger for those who do not use contraception prior to the first birth. We also expected the effect of contraceptive use to be one of the strongest and most consistent influences on age at first birth. However, this is not the case, and in a separate section later in the paper we show the effects of contraceptive use before the first birth. Therefore contraceptive use before the first birth is not included in the early analyses presented and, given the assumptions of the models used in the analysis, the exclusion of contraceptive use prior to the first birth should not affect the results with respect to the other variables (and our empirical tests confirm this).

Labor force experience prior to the first birth should also be reciprocally related to age at first birth. It can be argued that those who work prior to their first birth delay their first birth in order to allow them sufficient opportunity for employment. The reverse can also be argued. Those who have a late birth have more of an opportunity to work prior to the first birth. In short, the same kinds of issues that apply to the entire labor force participation and fertility relationship (see Waite and Stolzenberg, 1976; or Smith-Lovin Tickameyer, 1978, for recent summaries of this literature) apply here. Unfortunately, adequate labor force participation data are not available. But, again, given the assumptions of the models used in our analysis, the exclusion of labor force participation should not affect the results with respect to the other variables. It is unfortunate, though, that we are unable to see how much of the total effect of the exogenous variables operates through some of these excluded endogenous variables.

Finally, decisions about searching for a spouse and the timing of the first marriage should be reciprocally related to decisions about the timing of the first birth. Marriage and childbearing may be semi-independent processes that occur at the same time. Unmarried women tend to be young, and thus, women unmarried at the time of their first child will tend to be young. Patterns of intermarital fertility by age suggest this semi-independent process possibility (Rindfuss and Bumpass, 1977) On the other hand, a premarital birth may postpone the first marriage (Ryder and Westoff, 1971); or the inability to find the appropriate mate could postpone the first birth. Therefore, the direction and strength of the relationship between first marriage and age at first birth are unclear.

Unfortunately, age at first birth and age at first marriage are so highly correlated (between .7 and .8) that it is not possible to examine their reciprocal effects with presently available data. What is needed is prior measures of

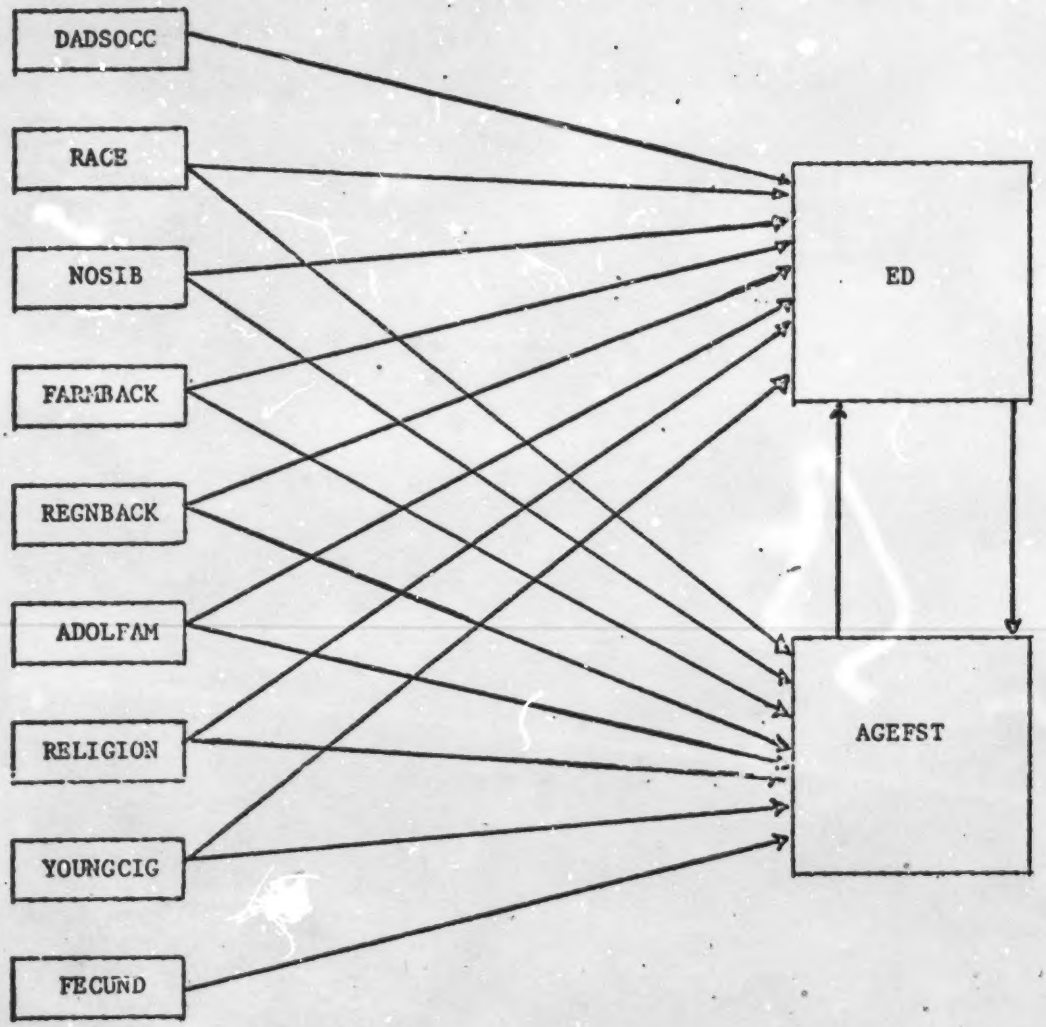
marriage timing preferences and fertility timing preferences. Given the greater consequences of the first birth for the life style of the woman (Rindfuss, forthcoming), we feel that it is more important to concentrate on the transition to motherhood than the transition to wife.[2]

Data and Analysis

The data used are from the 1970 National Fertility Study (NFS) and the 1973 Family Growth Study (FGS). The 1970 NFS is a multipurpose study based on a national probability sample of 6,752 ever-married women under 45 years of age residing in the continental United States (Westoff and Ryder, 1977). The 1973 FGS is a national probability sample of 9,797 women under age 45 who had ever been married or who were never married mothers, residing in the continental United States (National Center for Health Statistics, 1978). Both studies obtained complete birth and pregnancy histories, thus permitting analysis of age at first birth. Generally, both studies produce the same results and we focus on the results from the 1970 study. Whenever the results differ, the analyses from both studies are shown.

The first analysis examines determinants of female age at first birth. In later sections of this paper we also examine determinants of male ages at first birth--to the extent that it is possible with samples of ever married women. The first analysis uses data from the 1970 NFS, assumes that education and age at first birth affect each other reciprocally, and that both are affected by a set of exogenous factors reflecting background characteristics and characteristics of early adolescence. A model of these relationships is shown in Figure 1. Chart 1 shows how the variables in the model are measured. Means and standard deviations for all the variables are also shown in Chart 1. The zero-order correlations among all the variables in Figure 1 are shown in Table 1.

(Figure 1, Chart 1 and Table 1 about here)



Corresponding equations:

$$\hat{ED} = b_0 + b_1 \text{ DADSOCC} + b_2 \text{ RACE} + b_3 \text{ NOSIB} + b_4 \text{ FARMBACK} + b_5 \text{ REGNBACK} + b_6 \text{ ADOLFAM} + b_7 \text{ RELIGION} + b_8 \text{ YOUNGCIG} + b_9 \text{ AGEFST} + U$$

$$\hat{\text{AGEFST}} = c_0 + c_1 \text{ RACE} + c_2 \text{ NOSIB} + c_3 \text{ FARMBACK} + c_4 \text{ REGNBACK} + c_5 \text{ ADOLFAM} + c_6 \text{ RELIGION} + c_7 \text{ YOUNGCIG} + c_8 \text{ FECUND} + c_9 \text{ ED} + V$$

Figure 1. A model of the determinants of the beginning of motherhood.

CHART 1. MEASUREMENT OF VARIABLES IN THE EDUCATION AND AGE AT FIRST BIRTH MODEL

VARIABLE LABEL	VARIABLE NAME	UNITS OF MEASUREMENT	DESCRIPTION	MEAN	STANDARD DEVIATION
DADSOC	Respondent's fathers occupation	Duncan's SEI scores	Missing data were given the mean value	30.148	20.4
RACE	Race of respondent	Dummy variable	Blacks are coded 1, all others coded 0	0.109	0.31
NOSIB	Respondent's number of siblings	Actual number is coded		3.866	3.03
FARMBACK	Respondent's farm background	Dummy variable	Coded 1 if respondent grew up on a farm, all others coded 0	0.316	0.46
REGNBACK	Region where respondent grew up	Dummy variable	Coded 1 if respondent grew up in the South, all others coded 0	0.363	0.48
ADOLFAM	Household composition when respondent was 14	Dummy variable	Coded 1 if respondent lived with 0 or 1 of her parents at age 14, coded 0 if she lived with both parents at age 14	0.220	0.4
RELIGION	Respondent's religious preferences when growing up	Dummy variable	Coded 1 if Catholic, all others coded 0	0.229	0.4
YOUNGCIG	Whether respondent smoked at a young age	Dummy variable	Coded 1 if respondent smoked before age 16, coded 0 otherwise	0.137	0.3
FECUND	Whether respondent had a miscarriage before the first birth	Dummy variable	Coded 1 if respondent had a miscarriage before the first birth; coded 0 otherwise	0.100	0.3
ED	Respondent's education	Years of schooling completed	This is education at first marriage	11.551	2.3
AGEFST	Respondent's age at first birth	Years		21.973	4.3

Table 1. Zero-Order correlations among background factors, early adolescent characteristics, education and age at first birth: 1970 NFS, women aged 35-44 with 1 + children.

	DADSOCC	RACE	NOSIB	FARMBACK	REGNBACK	ADOLFAM	RELIGION	YOUNGCIG	FECUND	ED	AGEFST
DADSOCC	1.000										
RACE	- .144	1.000									
NOSIB	- .244	.156	1.000								
FARMBACK	- .323	.088	.274	1.000							
REGNBACK	- .129	.315	.150	.218	1.000						
ADOLFAM	- .056	.150	- .039	- .030	.071	1.000					
RELIGION	.053	- .152	.014	- .149	- .292	- .052	1.000				
YOUNGCIG	- .043	.030	.028	- .060	- .011	.067	- .010	1.000			
FECUND	.037	.035	.002	- .032	- .027	.018	- .002	.009	1.000		
ED	.370	- .222	- .328	- .185	- .211	- .157	- .012	- .171	.038	1.000	
AGEFST	.186	- .189	- .115	- .118	- .177	.111	.098	- .122	.216	.380	1.000

Note: Definitions, means and standard deviations for these variables are found in Chart 1.

The measurement of most of these variables is straightforward and requires no further discussion. It should be noted, however, that education at first birth is not used because such information is not available. Instead, education at marriage is used as a proxy for education at first birth. For most women this is reasonable, since the correlation between age at first marriage and age at first birth is 0.74. We have also experimented with education at interview as a proxy for education at first birth. The change in measurement does not produce any significant substantive change in our results. But it should be recognized that for the younger mothers the first birth is likely to precede the first marriage, and for the older mothers the first birth is likely to come some time after the first marriage.

In order to allow women sufficient time to get married (and thus, be eligible to be in the sample) and to have a first birth, the analysis of the relationships shown in Figure 1 will be limited to women aged 35-44. Most of those who will marry before the end of the reproductive period are married by age 35. For example, the proportion married at ages 40-44 is only 1 percent higher than at ages 35-39 (U.S. Bureau of the Census, 1972). The same holds true for first births. Most of those who will have a first birth have done so by age 35. For example, only 3 percent of the first births to the 1930 birth cohort occurred after age 35 (Heuser, 1976).

Childless women are excluded from this analysis of age at first birth. Only a small proportion (less than 10 percent) of the married women in these cohorts remained childless (Heuser, 1976). To the extent that postponement leads to voluntary childlessness (Veevers, 1973), this exclusion could lead to the estimated effects of background, early adolescent and simultaneous factors on age at first birth being weaker than the true effects. However, childlessness in these cohorts was primarily a product of fecundity impairments.

The model shown in Figure 1 includes background characteristics, aspects of early adolescence, and the reciprocal relationship between education and age at first birth. Period factors are not included, and this needs to be kept in mind when interpreting our results. The respondents in this analysis were aged 35-44 in 1970. Taking 15 as the youngest age at first birth and 35 as the oldest, this means that these women were having their first births from 1941 to 1970. During this long period there were a variety of events affecting the timing of fertility including World War II, the Korean War, and the Vietnam War. Those women who postponed their first birth were, of course, exposed to more period factors which could affect the timing of their first birth. Since so little is known about the nature of period factors that affect the timing of fertility (i.e. Rindfuss, Reed, and St. John, 1978), these factors cannot be explicitly included in the analysis. Furthermore, the younger women in our sample experienced the period factors at different ages than the older women in the sample. To see if this would affect our results, we ran the model separately for women aged 35-39 and 40-44. The results were virtually identical for the two groups.

We wanted to see the direct effects of the exogenous variables on age at first birth as well as the indirect effects through the educational process.[3] To do so, it is necessary to explicitly consider the reciprocal relationship between education and age at first birth. In order to estimate the reciprocal relationship between education and age at first birth, instrumental variables are needed for each of the two endogenous variables--i.e., variables are needed which directly affect one of the endogenous variables but not the other, which are not causally determined by the endogenous variables, and which are not correlated with the unspecified source of the endogenous variable for which it is not an instrumen

(Duncan, 1975; Heise, 1975). As can be seen from Figure 1, fecundity is used as the instrument for age at first birth and respondent's father's occupation as the instrument for education. Fecundity is measured as whether or not the respondent had a miscarriage prior to her first birth. A miscarriage before the first birth should have no effect on education, except indirectly through age at first birth. Nor should education have any effect on whether or not there is a miscarriage before the first birth. The only exception to this latter statement would involve a woman obtaining an induced abortion in order to complete her education. However, induced abortions are so grossly underreported in United States fertility surveys, that reported miscarriages are essentially spontaneous miscarriages.

That respondent's father's occupation only affects age at first birth indirectly through education has already been discussed (see p. 4). The only point to be added here is that empirically, once education is controlled, respondent's father's occupation does not have a significant relationship to age at first birth.

Estimation of the effects shown in Figure 1 was accomplished using two-stage least squares regression analysis (Goldberger, 1964; Johnston, 1972). The estimates were made using ordinary least squares in two steps, making the appropriate corrections as outlined by Haut (1977). The results are shown in Table 2.

(Table 2 about here)

The first thing to be noticed in Table 2 is that education has a large and significant effect on age at first birth, but age at first birth has a trivial and insignificant effect on education. In both cases, the relationship is positive as expected. However, the small effect of age at first birth on education is surprising given the conventional wisdom about having an early first birth. The reasons for this small effect, and the relationship between education

Table 2. Metric and standardized coefficients for a model of social and economic determinants of age at first birth, 1970 NFS.[a]

Dependent Variable	Predictor Variable	Metric Coefficient	Std. Error	Standardized Coefficient
ED	AGEFST	.052	.0543	.090
	DADSOCC	.030*	.0027	.258*
	RACE	-.685*	.1738	-.090*
	NOSIB	-.172*	.0169	-.219*
	FARMBACK	-.113	.1096	-.022
	REGNBACK	-.555*	.1138	-.113*
	ADOLFAM	-.669*	.1175	-.117*
	RELIGION	-.495*	.1155	-.088*
	YOUNGCIG	-.943*	.1506	-.137*
	FECUND	--	--	--
AGEFST	ED	.748*	.1429	.432*
	DADSOCC	--	--	--
	RACE	-.784*	.3171	-.060*
	NOSIB	.071	.0420	.052
	FARMBACK	-.217	.2063	-.025
	REGNBACK	-.368	.2139	-.043
	ADOLFAM	-.160	.2351	-.016
	RELIGION	.754*	.2226	.077*
	YOUNGCIG	-.612*	.2920	-.051*
	FECUND	2.652*	.2811	.194*

* Significant at 0.05.

[a] N = 1926. The measurement of these variables is described in Chart 1.

and subsequent fertility is discussed elsewhere (Rindfuss and Bumpass, forthcoming), and will not be repeated here.

Not surprisingly, fecundity, i.e. having a miscarriage or stillbirth prior to the first birth, has a strong delaying effect on age at first birth. As indicated by the standardized coefficients, after education, fecundity has the strongest effect on age at first birth. Given that this measure does not include induced abortions, it is tapping biological variation in the ability to carry a conception full term.

Race and religion both have significant effects on age at first birth. Blacks have their first child about four-fifths of a year younger than whites; and Catholics have their first child approximately three-quarters of a year later than non-Catholics. Over and above this direct effect of race on age at first birth, there is an indirect effect through education. Blacks receive .685 years of schooling less than whites. Because of the positive relation between education and age at first birth, race has a negative indirect effect on age at first birth reinforcing the negative direct effect of race on age at first birth. However, the indirect effect of religion through education is negative and thus, the total effect of religion on age at first birth is diminished.

Contrary to our expectations, number of siblings has a positive direct effect on age at first birth. Even though this direct effect is not statistically significant, the positive direction warrants some speculation. It is possible that the parents of large families have a difficult time making ends meet, and, as a result, urge their children to wait until they can afford to have their own children. It is also possible that the older children in large families have to spend some time working in order to support the younger children. Furthermore, the perceived quality of family life may be better in larger families, thus encourag-

ing the postponement of the starting of the family of procreation. On the other hand, the indirect effect of number of siblings on age at first birth is negative. The negative effect of number of siblings on educational attainment undoubtedly reflects the scarcity of material resources in large families. This combination of small positive direct effect and a negative indirect effect means that the overall relation is extremely small. The two different kinds of relationships may explain why number of siblings rarely is an important factor in explaining completed fertility; and it may also help to explain the lack of consistency in previous research with respect to the effect of number of siblings on completed fertility.

As expected, those that grew up on a farm and those that grew up in the South have their first child at younger ages than the rest of the population. For both variables, both the direct and indirect effects are negative. However, for neither variable is the direct relationship statistically significant. Because regional background has a substantially stronger effect on educational attainment, the total effect of regional background on age at first birth is stronger than the effect of farm background.

The respondent's father's occupation, as expected, has a strong indirect effect on age at first birth. If the respondent's father has a high status occupation, the respondent will remain in school for a longer period of time. This, in turn, leads to an older age at first birth.

Those who were not living with both of their parents at age 14 have, as expected, a younger age at first birth than those who were living with both parents. Note, however, that the direct effect of this variable on age at first birth is small and insignificant. Most of the overall effect operates indirectly through the negative effect on educational attainment.

Finally, it can be seen that those who begin smoking at a young age (before age 16) also have their first child at a young age. Not only does youthful smoking have a strong, significant, negative direct effect on age at first birth, but youthful smoking also has a strong depressing effect on educational attainment. Overall, this variable has a sizeable total effect on age at first birth. Thus, those that begin "adult" behavior at a young age are likely to become mothers at a young age. Some caution needs to be exercised in interpreting this relationship. It is extremely doubtful that young cigarette smoking, per se, "causes" early motherhood. Rather, young cigarette smoking is an indication of a large variety of adolescent behaviors that can lead to early motherhood.

Because of the simultaneity of education at marriage and age at first birth it is difficult to see the complete effect of each independent variable on each dependent variable. Taking this simultaneity into account we present the total effects of each exogenous variable in our model on each endogenous variable in Table 3. As can be seen from this table the effects of exogenous variables on education at marriage through age at first birth do not make a substantial contribution to the effects of these variables not taken through age at first birth. However, the effects of the exogenous variables on age at first birth through education at marriage comprise substantial proportions of the exogenous variables' total effects on age at first birth. For two variables, number of siblings and religion, the effect through education at marriage has a sign opposite the effect not through education, substantially reducing the size of the total effects of these variables on age at first birth. That the effects of the exogenous variables on age at first birth through education are substantial, while the reverse is not true, is a product of relative sizes of the loop coefficients; the coefficient (standardized) from education at marriage to age at first birth (.432) being much larger than the loop coefficient leading in the other

direction (.090).

(Table 3 about here)

Racial interaction

There is some evidence to suggest that the family building process may be different for whites than for blacks. For example, blacks have higher illegitimacy rates than whites (NCHS, 1977), and blacks appear to rely more heavily on relatives to take temporary, but primary, care of children born to young mothers than whites (Rindfuss, 1977). Further, whites have an older age at first birth than blacks--the means are 22.2 and 19.8 respectively. In order to check a potential interaction with race, we reran the analysis separately for whites and blacks. This is shown in Table 4. The model is the same as that shown previously for the total sample with the exception that farm background is not included. This exclusion was necessary to avoid multicollinearity problems; there are virtually no blacks who grew up on northern farms.

(Table 4 about here)

There are differences between whites and blacks in this process. However, the differences involve differences in the magnitude of the effects, rather than differences in the direction of the effects. In fact, there is remarkable similarity in the direction of effects across the two populations. In every case the direction of the effect of the predictor variables is the same for whites and blacks.

The two variables that consistently show the largest differences are religion and the region in which the respondent grew up. The detrimental effect of growing up in the South is greater for blacks than for whites--which is exactly what one would expect. It will be interesting to see if this changes with integration. And, the effect of religion on either educational attainment or age at first birth is stronger among whites than among blacks. Given the scarcity of black Catholics, this is not surprising.[4]

Table 3. Decomposition of total effects of predictor variables on education at marriage and age at first birth into: (1) effects directly on endogenous variables and through loop and (2) effects indirectly on endogenous variables (through other endogenous variable) and through loop.[a]

Predictor Variable	Total Effect on ED	Effect on ED not Through AGEFST	Effect on ED Through AGEFST
DADSOCC	.268	.268	--
RACE	-.100	-.094	-.006
NOSIB	-.223	-.228	.005
FARMBACK	-.025	-.023	-.002
REGNBACK	-.122	-.118	-.004
ADOLFAM	-.121	-.120	-.001
RELIGION	-.085	-.092	.007
YOUNGCIG	-.148	-.143	-.005
FECUND	.018	--	.018
AGEFST	.094	--	--

Predictor Variable	Total Effect on AGEFST	Effect on AGEFST not Through ED	Effect on AGEFST Through ED
DADSOCC	.116	--	.116
RACE	-.102	-.062	-.040
NOSIB	-.044	.054	-.098
FARMBACK	-.036	-.026	-.010
REGNBACK	-.096	-.045	-.051
ADOLFAM	-.070	-.017	-.053
RELIGION	.040	.080	-.040
YOUNGCIG	-.115	-.053	-.062
FECUND	.202	.202	--
ED	.449	--	--

[a] All effects are calculated using the path analytic rates of transmittance outlined in D. Heise (1975).

Table 4. Metric and standardized coefficients for a model of social and economic determinants of age at first birth, for whites and blacks, 1970 NFS.[a]

Dependent Variable	Predictor Variables	Metric Coefficients		Standard Errors		Standardized Coefficients	
		White	Black	White	Black	White	Black
ED	AGEFST	.057	.045	.0548	.1261	.102	.094
	DADSOCC	.031*	.024*	.0027	.0093	.282*	.130*
	NOSIB	-.194*	-.076*	.0174	.0355	-.246*	-.105
	REGNBACK	-.491*	-1.353*	.1127	.4478	-.101*	-.199*
	ADOLFAM	-.604*	-.952*	.1206	.3298	-.107*	-.171*
	RELIGION	-.459*	-.149	.1126	.6328	-.088*	-.011
	YOUNGCIG	-.919*	-1.073*	.1510	.4455	-.139*	-.147*
	FECUND	--	--	--	--	--	--
AGEFST	ED	.786*	.959*	.1411	.7010	.442*	.499*
	DADSOCC	--	--	--	--	--	--
	NOSIB	.058	.126*	.0483	.0877	.042	.091*
	REGNBACK	-.342	-1.109	.2224	1.2274	-.040	-.085
	ADOLFAM	-.090	-.683	.2501	.8613	-.009	-.064
	RELIGION	.828*	.524	.2241	1.2517	.090*	.021
	YOUNGCIG	-.501	-1.219	.3053	1.0499	-.043	-.087
	FECUND	2.606*	3.859*	.2973	1.0201	.302*	.185*

* Significant at 0.05

[a] Other non-whites are not included. The measurement of these variables is described in Chart 1. N(whites) = 1714 and N (blacks) = 396.

For both blacks and whites, education has a strong and significant effect on age at first birth and age at first birth has a trivial and insignificant effect on education. However, the effect of education on age at first birth is stronger among blacks than among whites (B equals 0.959 and 0.786 for blacks and whites respectively). This may reflect the fact that education leads to alternatives which are more attractive than early childbearing among blacks than among whites. Or it may reflect the fact that the normative age schedule of first birth aspirations is younger among blacks than whites, thus leading to greater overlap in the decision-making process with respect to education and fertility.

Ethnicity

The 1973 FGS includes information on ethnic background; and so, it is possible to see if ethnicity has any effect on age at first birth. As noted earlier, ethnicity is of potential interest because some nations have had traditionally late ages at first birth, such as Ireland, while others have had much younger ages, such as many of the Southern European countries. We experimented with a variety of groupings and codings for ethnicity, and our results can be summarized as follows: In no case did any ethnic group or groups have a significant direct effect on age at first birth. However, when those of European background are grouped together and contrasted with all others (consisting, primarily, of those from Latin American background), coming from a European background leads to a higher level of educational attainment, and thus indirectly effects age at first birth.[5]

Contraception and the timing of the first birth

The effect of contraceptive use prior to the first birth on age at first birth provides the only major example of finding different results using the 1970 NFS and the 1973 FGS. The nature of the difference is intriguing and we will discuss it in some detail here. In analyzing the 1970 NFS data we found that contraceptive use before the first birth had no effect on age at first birth when other background factors were controlled. In fact, the distribution of ages

at first birth is surprisingly similar for those who did and those who did not use contraception before the first birth. This absence of a difference between users and nonusers may be due to two causes: (1) Use of contraception may be associated with an earlier age at first intercourse, and thus may be associated with an increased risk of conception and (2) What is described as use or non-use before the first birth may not conform to a clinical definition of use. For example, Kantner and Zelnick (1972) report that a large fraction of American teenage females believe that the least likely time to get pregnant is during the middle of the menstrual cycle. Thus, the use of rhythm coupled with this mistaken knowledge could hasten rather than postpone the first birth.

In the 1973 FGS, on the other hand, contraceptive use before the first birth has a significant positive influence on age at first birth, in accordance with our original expectation. In the process of exploring possible reasons for the different results for the two samples, both the NFS and FGS samples were divided into four age groups to control for any cohort differences in the importance of contraceptive usage as an independent variable. Because of differences in the date of interview, there are two groups of women, one in each sample, that do not have cohort counterparts in the opposing sample. These groups are the FGS women aged 35-37 in 1973 and the NFS women aged 42-44 in 1970. Table 5 shows the effect contraceptive use before the first birth has on age at first birth for both samples and for each of the five cohorts. Table 5 indicates that there are two reasons for the stronger effect in the FGS sample than the NFS sample. First, in each cohort comparison, the effect of age at first birth is larger in the FGS sample than in the NFS sample. Second, the size of the relationship varies from cohort to cohort, and the size of the effect in the non-overlapping cohort from the FGS sample is considerably bigger than the size of the effect in the non-overlapping cohort from the NFS sample. We are not sure why this relationship

varies from cohort to cohort, but the similarity in variation in the two samples suggests that it is real. Of particular interest is the birth cohort of 1931-1932. For this cohort, in both samples, the effect of contraceptive use before the first birth is the smallest, and in the 1970 NFS the relationship is negative. We do not have an explanation for the cohort patterning shown in Table 5, but it is likely that "period" explanations are needed. (It is worth noting that those born in 1931 and 1932 reached age 15 in the postwar years of 1946 and 1947) Nor do we have an explanation for the differences between the two samples. But these differences are unsettling, and warrant further investigation.

(Table 5 about here)

Theoretically, contraceptive use before the first birth is a process which is occurring simultaneously with the planning of the first birth. However, because we do not have instrumental variables for contraceptive use before the first birth, and because contraceptive use before the first birth is a dichotomous variable, we can not explicitly examine the reciprocal relationship between it and age at first birth.

Age at Fatherhood

We expect the social determinants of the age at first birth for men to be similarly related to women. Based on the analysis for women reported in this paper, we expect education to have the strongest effect. Those men who terminate their education early in order to enter the labor force may be seeking to obtain other adult statuses, such as fatherhood, and they may also be drawing a salary that makes them more able to afford children than students would be. At the same time men who are still in school may seek to postpone fatherhood in order to complete schooling in hopes of pursuing careers. However, in American society, fatherhood has a less dramatic impact on men's lives and their future life

Table 5. Effect of contraceptive use before the 1st birth on age at first birth.[a]

	Metric Coefficients		Standard Errors		Standardized Coefficients	
Birth Cohort	1970 NFS	1973 FGS	1970 NFS	1973 FGS	1970 NFS	1973 FGS
1936-1938		1.1409		.2713		.1257
1933-1935	.3236	.8595	.3092	.2965	.0406	.0890
1931-1932	-.1894	.2936	.3954	.4327	-.0211	.0287
1929-1930	.2964	.9216	.4206	.3865	.0344	.0960
1925-1928	.3463		.3986		.0340	

[a] Controlling for 1970 NFS: race, region where respondent grew up, family living arrangements at age 14, religion, number of siblings, farm background, education and fecundity. Respondent's father's occupation and youthful smoking are not included because 1973 FGS does not include these variables and we desired to make this analysis comparable.

choices than motherhood has on women. Men are more likely to complete their educations and training after becoming fathers than women are after becoming mothers. Therefore, we expect the effect of education on age at first birth for men to be less than it was found to be for women.

To test this 1970 NFS data were used. To obtain a sample of men for whom adequate information on age at first birth was available we selected only men (a) whose wives were 35-44 at the time of interview and had at least one live birth, (b) who were only married once and were currently married, and (c) who were married to wives who were once married. Although such restrictions are necessary in order to correctly identify the first birth of the husband (assuming no premarital births to other women), these restrictions eliminate a large part of the sample due to divorces and deaths to spouses, and may therefore make the findings less generalizable.

Two-stage least squares estimation of a model identical to the one developed for NFS women was used, with the exception that information on regional background, farm background, adolescent family background, and smoking at young ages was not available. The results indicate no major substantive differences between men and women in regard to determinants of age at first birth, for those variables which were available for both men and women. A minor difference is that race has no direct effect on age at first birth for men, as it did for women. The effect of race is indirect, through education, for men. The major effect of all background variables for men, except for religion while growing up, on age at first birth are felt through education. However, the effect of education on age at first birth, for men, is not as strong as it was for women. This supports the hypothesis that fatherhood is seen as a less dramatic event in the life courses of men than motherhood is for women.

Summary and Conclusions

To summarize our findings; of all the variables we refer to as background characteristics only two, race and religion, have both substantial direct and indirect effects on age at first birth. Being black has a negative direct effect on age at first birth while being Catholic has a positive effect. The negative effect of race on age at first birth is strengthened by the negative impact of being black on education. Although remaining positive, the effect of religion on age at first birth is reduced by the negative impact of being Catholic on education. All other background characteristics affect age at first birth indirectly through education, the characteristic having the largest effect being father's occupation.

Of the variables we refer to as early adolescent characteristics, fecundity has a substantial effect on age at first birth; women who have miscarriages before their first live birth postpone the age of first birth accordingly. They are also likely to be less fecund than other women and less susceptible to conception. Living with one or fewer parents as an adolescent has virtually no direct effect on age at first birth but does have a slight negative effect by way of its negative direct effect on education. Youthful smoking has a negative direct effect on age at first birth, which is strengthened by its negative effect on education.

The indirect effects of both background and early adolescent characteristics on age at first birth points out the important and powerful mediating effect of education. Education itself has a strong effect on age at first birth but age at first birth has only a trivial reciprocal effect on education. This latter finding contradicts the widely accepted notion that many teenage mothers are forced to leave school because of their pregnancy.

The importance of youthful smoking and education in determining age at first birth deserves further attention. Both youthful smoking and education are indicators of a variety of processes that take place during adolescence. Characteristically, these processes involve the transition from adolescent to adult, including attainment of the adult associated roles that come with motherhood as well as the timing of this event. Because age at first birth, in turn, affects such things as occupational attainment, marital stability, asset accumulation, and subsequent fertility we suggest that it is time for those interested in the sociology of fertility to pay closer attention to the transition from girl to adolescent to mother. Thus far, most students of fertility, have concentrated on those who are already mothers. The kinds of data thus far collected on fertility, reflect this focus. We suggest that it would be interesting to concentrate on teenage women who have yet to give birth.

FOOTNOTES

1. As indicated by marginals in various US fertility studies.
2. It should be noted that there is not complete agreement in the literature on this point. For example, Marini (1978) has recently argued that age at marriage is more important than age at first birth in the transition to adulthood because age at marriage "usually sets a lower limit on the age at which first birth occurs." As argued elsewhere (Rindfuss and Bumpass, 1978), we disagree. In the first place, the first birth can precede the first marriage. And the younger the age at first birth, the greater the likelihood that the first birth will precede the first marriage. Second, people often time their first marriages based on when they want to have their first child, as reflected in the phrase "time to settle down and start a family." The high incidence of premarital intercourse argues against the notion that age at first marriage sets a lower bound on on exposure to the risk of conception. Third, when people are asked what marks the transition to adulthood, "becoming a parent" is the modal response of married parents (Hoffman, 1978). Fourth, being a parent is more permanent than being a spouse. This is particularly the case for women, since children tend to stay with the mother following a marital disruption. Preston (1975) has estimated that almost half of the current marriages will end in divorce. Thus women can, and often do, move in and out of the wife role.

3. Because of the simultaneity of education at marriage and age of first birth it is really improper to talk of direct and indirect effects. This is because the effects of all exogenous and endogenous variables are mediated by the loop between ED and AGEFST. Therefore, no variables in our model have direct and indirect effects as are usually calculated in the decomposition of effects as covered by Alwin and Hauser (1975). However, since it is easier to talk about the effects of the dependent variables as being direct or indirect and because this terminology is widely understood and accepted, we will refer to the effects of our independent variables as being direct or indirect (see Table 3).
4. When we replicated this analysis, religion had a positive but statistically insignificant effect on education, and the detrimental effects of growing up in the South were somewhat stronger among whites than among blacks. This lack of consistency in the differences between whites and blacks between replications further points out the similarity in the processes for whites and blacks.
5. It should be noted that the lack of a direct effect of ethnicity on age at first birth may be the result of the type ethnicity information which is available: It is not possible to tell the number of generations the respondent has been in the United States. First generation immigrants are coded the same as those whose ties to the country of origin go back four or five generations. Nor is it possible to tell the strength of the ties the person has to the ethnic community.

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